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MEMORANDUM

MEMO BY S. A. Clark TO H. D. Bradley DATE April 29, 1982
Advanced Projects, Environmental and
FILE TITLE Regulatory Affairs (APERA) - Comments on the
Preliminary Fugitive Dust Emissions Study
for the Intermountain Power Project (IPP)

This memorandum is in response to the April 5, 1982 request by Document Control Form for comments on the "Fugitive Dust Emissions" study (preliminary report) prepared by Black & Veatch (B&V). The report was reviewed for possible errors in analysis and/or the omission of important issues. APERA provides the following comments.

1. The Fugitive Dust Emissions study compared the particulate matter (PM) emission impacts to the PSD increment standards but not to the National Ambient Air Quality Standards (NAAQS). The Prevention of Significant Deterioration (PSD) increment standards are the controlling standards for IPP, but an explanation that IPP will also comply with the NAAQS will make the B&V PM emissions study more complete.

2. The Fugitive Dust Emissions study did not account for PM emissions from the chimneys. Both PM chimney and fugitive (from sources other than the chimney) emissions must be included in the IPP air quality impact analysis.

3. The combined effect (chimney and fugitive emission impacts) could be a 121% consumption of the available 24-hour PSD increment for PM resulting in a significant violation. The H. E. Cramer Company estimated in their June 1981 report, "Calculated Air Quality Impact of Emissions From the IPP Power Plant for the Revised Stack Configuration", that the PM emissions from the chimneys will consume 21.6% of the 24-hour PSD increment for PM. The B&V study estimated that PM fugitive emissions will consume 99% of the 24-hour PSD increment in the same general locality (North-Northeast (NNE) corner of plant boundary) of the chimneys' emission impact.

4. PM emissions from haul roads were not considered in the Fugitive Dust Emissions Study. APERA feels it is probable that IPP will not have to consider these emissions in any further study. A source is not required to include temporary PM emissions from haul roads in a PSD impact analysis. A source is only required to consider non-temporary PM emissions from haul roads under current Federal regulations.

Non-temporary PM emissions from haul roads were not included in the air quality modeling study performed by Utah and subsequently revised by the Environmental Protection Agency (EPA) on May 30, 1980, prior to issuance of the IPP permit.

5. B&V may have used PM emission factors (EF) that are not as beneficial to IPP as other available EF recommended by EPA. A quick check by Tim L. Conkin of APERA shows that there may be a substantial decrease in the EF for the reserve coal storage pile (contributes approximately 78% of PM fugitive emissions impact) by using the EF equation given in the September 23, 1982 report "Workbook on Estimation of Emissions and Dispersion Modeling for Fugitive Particulate Sources" prepared Environmental Research and Technology, Inc. (ERT). ERT states this EF equation has numerous shortcomings but was recommended by EPA in 1981.

6. B&V used the Industrial Source Complex (ISC) model to estimate PM fugitive emission impacts for IPP. The ISC model is probably the correct model to use for IPP impact analysis. The ISC model was not the model used by Utah and EPA for the IPP impact analysis but it is an EPA-recommended model for estimating short-term and annual concentrations during a one-year period for complex industrial sources.

7. Not all of the PM 24-hour average fugitive emission impact concentrations were given in this study. The 24-hour average fugitive emission impacts for PM by modeling modified coal and a reserve coal storage pile at 2,153,000 tons are not given. Presently the reserve coal storage pile is designed for 2,153,000 tons. APERA feels the Department should be informed of all PM impact concentrations.

8. APERA feels further consideration should be given to using worst case coal characteristics not as restrictive as the worst case coal (modified coal) characteristics used in the B&V study. It was pointed out by the Mechanical Engineering Section (MES) that an average of 50% coal B and 50% coal F will give worst case coal characteristics not as restrictive as the modified coal and EPA may feel this average is a reasonable assumption.

9. APERA feels consideration should be given to extending the NNE plant boundary to mitigate the most severe PM impacts. The most restrictive 24-hour average PM impacts occur approximately at the NNE plant boundary (impacts inside the plant boundary are not considered by EPA in the impact analysis). The impacts diminish with distance away from the boundary. Therefore, extending the plant boundary in this area would reduce the PM impacts at the new boundary, thus consuming less of the 24-hour PM increment.

10. On page A-4 (Appendix), Part A, Reserve Coal Storage, B&V makes a mathematical error. The last mathematical operation in Part A should equal 0.00001g/sec/m2 and not 0.0001g/sec/m2.

On April 6, 1982, Mr. Tim L. Conkin of the APERA Office and Ms. Charlotte Welty of the MES, talked by telephone with Mr. Dan Nelson of B&V concerning the Fugitive Dust Emissions study. Mr. Nelson stated that he was compiling a list of B&V- and Department-suggested changes to the study. Mr. Nelson will include these suggestions in a letter he will send to the Department and will not proceed with further studies until the Department has reviewed any changes to be made to the study. The air quality issues discussed and conclusions made are listed below.

1. Mr. Nelson agreed that compliance with the NAAQS should be addressed in any future B&V PM emissions impact study to make the study more complete. It was pointed out that the 24-hour secondary NAAQS (protects against adverse welfare effects) for PM is presently in violation due to background concentrations attributed to wind-blown soil that is uncontaminated by pollutants resulting from industrial activity. The June 1981 H. E. Cramer IPP air quality impact report discusses that uncontaminated wind-blown soil background concentrations need not be considered in assessing compliance with the NAAQS. The B&V PM emissions impact study should also discuss this point.

2. Mr. Nelson stated that the B&V study did not include PM chimney emission impacts. Mr. Nelson feels that the H. E. Cramer study impacts and the B&V study impacts will probably be additive to show 121% consumption of the 24-hour PSD increment. B&V will include PM chimney emissions in any further study.

2. It was suggested that non-temporary PM emissions from haul roads should be considered in any further study even though they were not considered in the Utah modeling (revised by EPA). It was felt that non-temporary haul road emissions will not contribute much to the PM impacts because the roads will probably be paved. Inclusion of these emissions or a statement that they do not significantly contribute to PSD increment consumption will make the impact report more complete. Mr. Nelson will investigate the contribution non-temporary PM emissions from haul roads make on the increment consumption.

4. Mr. Nelson stated that the EF used in the Fugitive Dust Emissions study had been previously accepted by EPA Region VIII. It was pointed out that different EF are suggested for use by ERT in the "Workbook on Estimation of Emissions and Dispersion Modeling for Fugitive Particulate Sources". Mr. Nelson stated he has been trying to obtain this document and would be very interested in receiving it. APERA will send a copy to Mr. Nelson and Mr. Nelson will include his comments on this ERT document in his letter to the Department.

5. Mr. Nelson felt the EPA-recommended ISC computer model (used in the B&V study) was the correct model to use in this study and that the previously used Utah Valley model (used by Utah in the IPP PM impact study prior to issuance of the permit) is of another era. Also, Mr. Nelson did not understand how the Utah Valley model could be applied to fugitive emissions. It was pointed out by Mr. Nelson that Utah and EPA previously only considered PM annual average impacts and not 24-hour average impacts. Neither Mr. Nelson nor APERA understands why the 24-hour average PM impact was not addressed by Utah and EPA. Mr. Nelson further pointed out that the annual average impacts predicted by the Utah Valley model are greater than that predicted by B&V's ISC model. Therefore, it is felt that the Utah Valley model will predict greater 24-hour average impacts than the ISC model.

6. Mr. Nelson agreed to inform the Department of the modeled PM impacts when modified coal characteristics and a reserve coal pile of 2,153,000 tons is considered (impacts not given in the preliminary report).

7. Mr. Nelson will give further consideration to the modeling of IPP worst case coal characteristics not as restrictive as the worst case modified coal characteristics which were modeled in the preliminary PM fugitive emissions impact analysis.

8. Mr. Nelson will analyze the amount of additional NNE acreage required to move the NNE IPP boundary to a point where PM impacts outside of the boundary will not violate any PSD increments.

9. Mr. Nelson stated that the ash silo vents are now to be included in the IPP design. The EPA was previously informed that there would be no ash silo vents and EPA, therefore, did not consider ash silo emission impacts prior to issuance of the permit. Ash silo vent PM emission impacts were also not modeled in the preliminary Fugitive Dust Emissions study, but will be modeled in any further studies. This will result in an increase in increment consumption.

If you have any questions or comments, please contact Tim L. Conkin at extension 5794.

TLC TLC:gp

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TABLE III

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) AND PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENTS FOR CLASS II AREAS

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)		Class II PSD Increment ($\mu g/m^3$)
		Primary	Secondary	
SO_2	3 Hours	-	1,300	512
	24 Hours	365	-	91
	Annual	80	-	20
Particulates	24 Hours	260	150	37
	Annual*	75	60	19
NO_2	Annual	100	-	-

*Annual geometric mean.

TABLE IV

CALCULATED MAXIMUM SHORT-TERM AND ANNUAL AVERAGE GROUND-LEVEL SO_2 AND PARTICULATE CONCENTRATIONS EXPRESSED AS PERCENTAGES OF THE CORRESPONDING CLASS II PSD INCREMENTS

Pollutant	Averaging Time	Maximum Concentration (% of Class II PSD Increment)
SO_2	3 Hours	27.9
	24 Hours	67.0
	Annual	10.6
Particulates	24 Hours	21.6
	Annual	1.4

TABLE 3-6

CALCULATED MAXIMUM GROUND-LEVEL SO_2, PARTICULATE AND NO_2 CONCENTRATIONS WITH THE EFFECTS OF BACKGROUND INCLUDED

Pollutant	Averaging Time	Concentration ($\mu g/m^3$)		
		IPP	Background	Total
SO_2	3 Hours	143	77	220
	24 Hours	61	26	87
	Annual	2.12	0	2.12
Particulates	24 Hours	8	193	201
	Annual	0.27	20	20.27
NO_2	Annual	9.60	2	11.60

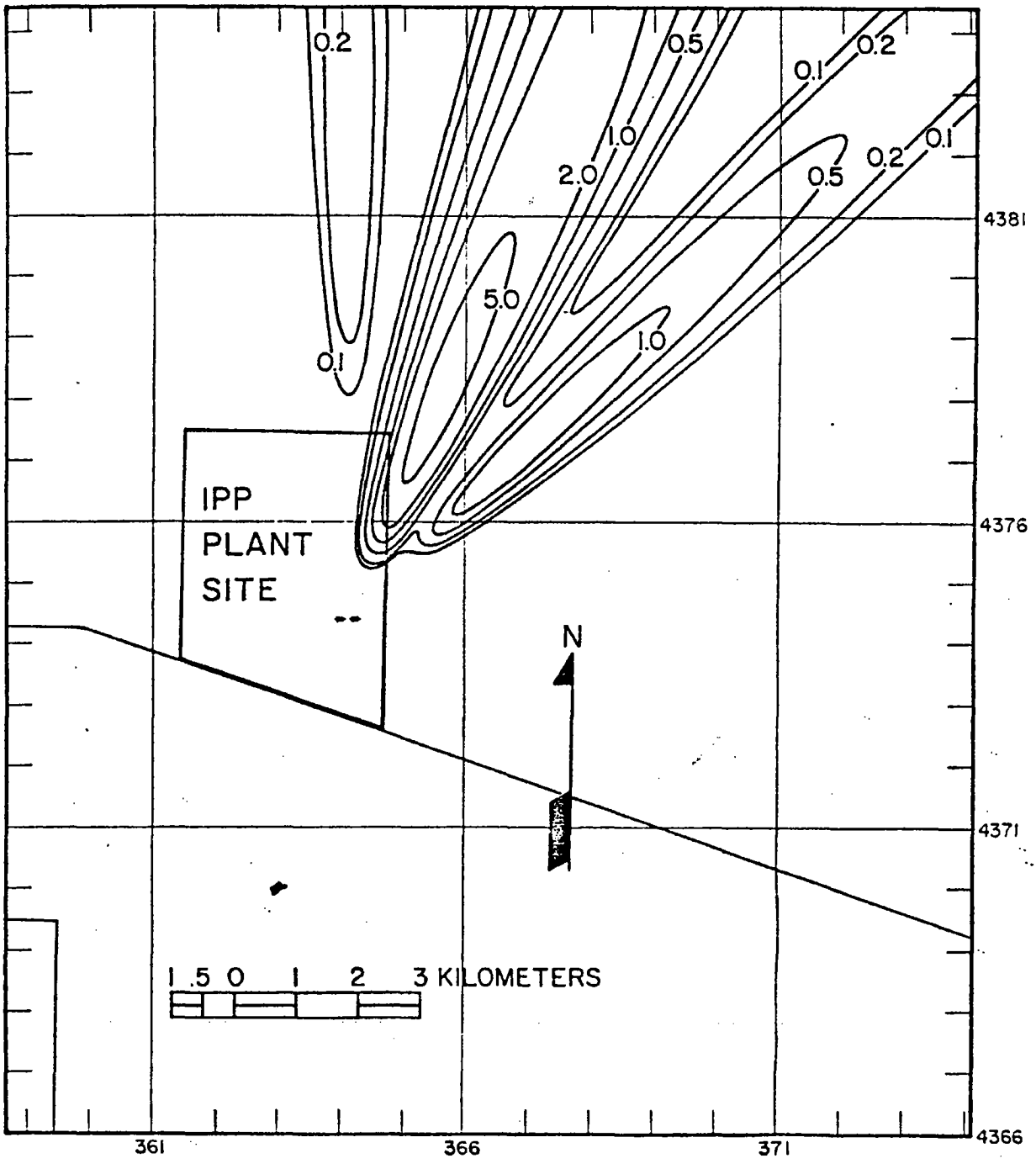

FIGURE 3-5. Calculated isopleths of 24-hour average ground-level particulate concentration in micrograms per cubic meter attributable to emissions from the IPP Power Plant during the "worst-case" 24-hour period (2200 MST on 22 June 1950 through 2100 MST on 23 June 1950).

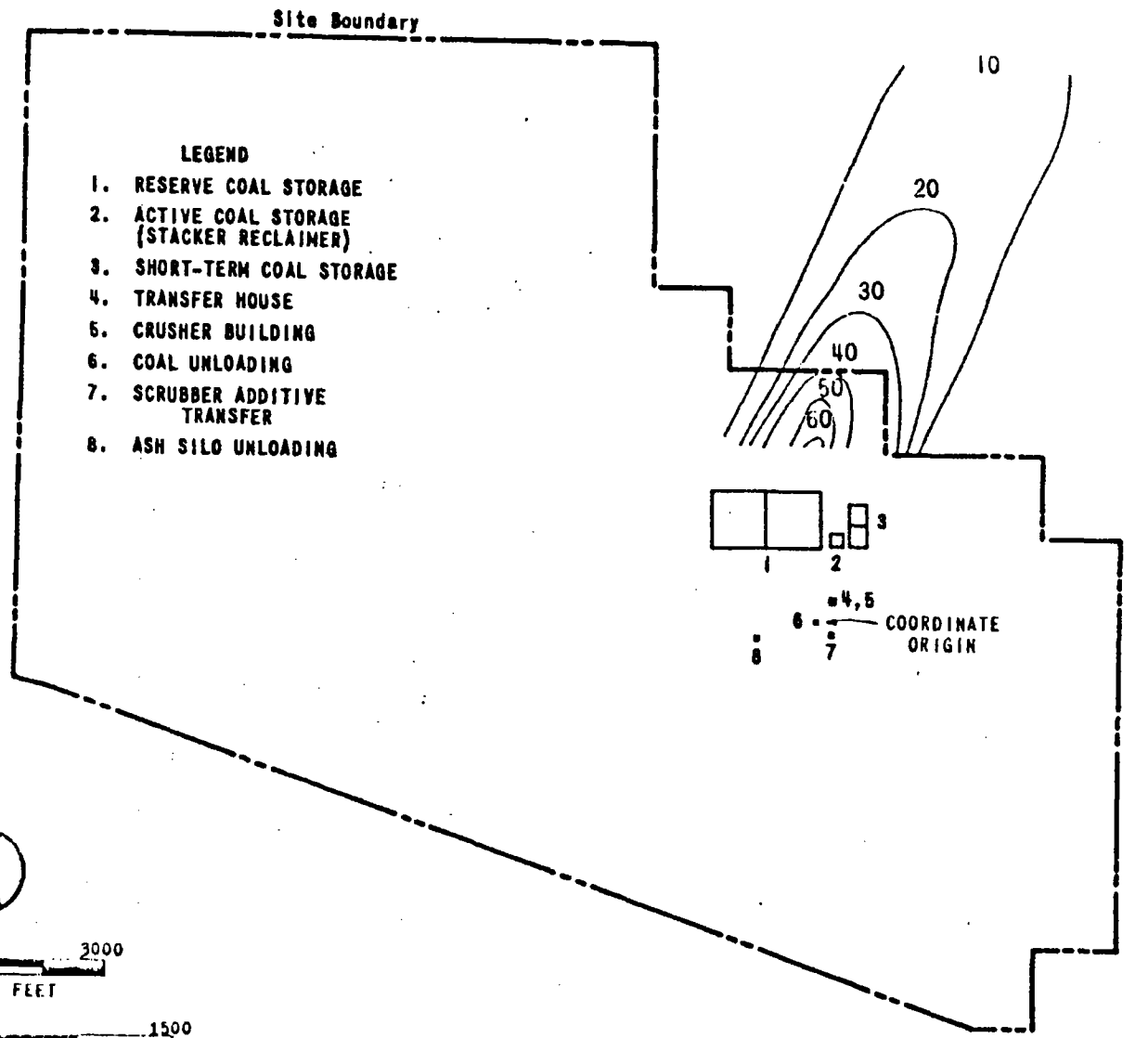

FIGURE 6-4. ISOPLETHS OF 24-HOUR PREDICTED PARTICULATE CONCENTRATION BASED ON MODIFIED COAL CHARACTERISTICS (MICROGRAMS PER CUBIC METRES)

6.0 MODELING RESULTS

The modeling analysis objective was to ensure that fugitive dust emissions from the current facility configuration would meet the PSD Class II particulate increments. These increments are 19 and 37 micrograms per cubic metre for annual and 24-hour averaging times, respectively. Annual and 24-hour particulate concentrations were predicted considering weighted average and worst case modified coal characteristics.

Preliminary dispersion modeling predicted that the maximum offsite particulate concentrations would be within the Class II increments using the weighted coal characteristics, but slightly over the 24-hour Class II increment for the modified coal characteristics. The modified coal has a reduced heating value; thus, four units operating at 100 per cent capacity would require more coal to be burned. By burning more coal with an increased ash content, more ash would be generated and require disposal. The handling of more ash would increase the fugitive emissions and result in higher predicted particulate concentrations. To offset this increase, the reserve storage pile was reduced from 2,153,000 tons to 1,987,000 tons when predicting 24-hour concentrations based on the modified coal. 77%

The effect of the different coal characteristics on the annual and 24-hour predicted particulate concentrations is shown on Figures 6-1 through 6-4. The maximum predicted annual particulate concentration offsite, assuming use of the weighted average coal, is 12.3 micrograms per cubic metre and occurs at the corner of the plant boundary directly northeast of the coal storage areas (Figure 6-1). The dispersion modeling which considered the modified coal predicted the maximum annual particulate concentration to be at the same location but 13.7 micrograms per cubic metre (Figure 6-2). The corresponding maximum 24-hour offsite particulate concentrations, considering the weighted average and modified coal characteristics, are 36 and 36.5 micrograms per cubic metre, respectively (Figures 6-3 and 6-4). The 24-hour maximum concentrations are predicted to occur at slightly different locations along the plant boundary, north and north-northeast of the coal storage area. Copies of the pertinent computer

output for the annual and 24-hour particulate concentration predictions are presented in Appendices B and C, respectively.

Tables 6-1 and 6-2 present the individual source contributions to the maximum annual and 24-hour offsite particulate concentrations. As shown in the tables, the individual per cent contributions to the maximum concentrations vary with the coal characteristics. The tables also show the reserve coal storage and fly ash silo unloading to be the major contributors. Depending on the type of coal, weighted average or modified coal, the reserve coal storage contributes either 23 or 20 per cent of the total annual particle concentration, while the fly ash silo unloading is predicted to contribute 40 or 45 per cent. For 24-hour predicted concentrations, the reserve coal storage contribution is either 81 or 78 per cent and the ash silo unloading is 17 or 22 per cent of the total offsite particulate concentration.

The maximum predicted offsite particulate concentrations are within the PSD Class II particulate increments of 19 and 37 micrograms per cubic metre for annual and 24-hour averaging times, respectively. Since conservative assumptions were used throughout the analysis and the predicted concentrations are within the Class II increments, the Intermountain Generating Station is expected to comply with the PSD Class II increments for particulates.